

FORM PTO-1390
(REV. 12-29-99)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/601013

INTERNATIONAL APPLICATION NO.

PCT/DE 99/100369

INTERNATIONAL FILING DATE

17 Feb. 1999

PRIORITY DATE CLAIMED

18 Feb. 1998

TITLE OF INVENTION

DEVICE FOR TESTING THE ELECTROMAGNETIC COMPATIBILITY OF SYSTEMS HAVING LARGE

APPLICANT(S) FOR DO/EO/US

WILBERT, JAN PAUL

DIMENSIONS

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern document(s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☐ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☐ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.

Please send me an email that you
received:

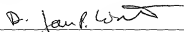
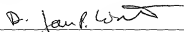
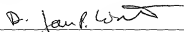
- Transmittal Letter
 - Translation of the International Application
 - Examination Report and transl. of the Annexes
 - Credit Card Payment Form with the right
payment amount
- to jan.wilbert@t-online.de



Sandimmune

Kapseln 25 mg/100 mg

U.S. APPLICATION NO. 097601013		INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
---------------------------------------	--	-------------------------------	--------------------------

<p>17. <input type="checkbox"/> The following fees are submitted:</p> <p>BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):</p> <p>Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$970.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$840.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$690.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$670.00</p> <p>International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$96.00</p> <p style="text-align: right;">ENTER APPROPRIATE BASIC FEE AMOUNT = \$</p> <p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)). \$</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 20%;">CLAIMS</th> <th style="width: 20%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 20%;">RATE</th> <th style="width: 20%;"></th> </tr> <tr> <td>Total claims</td> <td>- 20 =</td> <td></td> <td>X \$18.00</td> <td>\$</td> </tr> <tr> <td>Independent claims</td> <td>- 3 =</td> <td></td> <td>X \$78.00</td> <td>\$</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>+ \$260.00</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL OF ABOVE CALCULATIONS =</td> <td>\$</td> </tr> <tr> <td colspan="4">Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: right;">SUBTOTAL =</td> <td>\$</td> </tr> <tr> <td colspan="4">Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL NATIONAL FEE =</td> <td>\$</td> </tr> <tr> <td colspan="4">Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property</td> <td>\$</td> </tr> <tr> <td colspan="4" style="text-align: right;">TOTAL FEES ENCLOSED =</td> <td>\$ 840</td> </tr> <tr> <td colspan="4"></td> <td>Amount to be refunded: \$</td> </tr> <tr> <td colspan="4"></td> <td>charged: \$</td> </tr> </table> <p>a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>840</u> to cover the above fees is enclosed. ↳ credit card payment form</p> <p>b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed.</p> <p>c. <input type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. _____. A duplicate copy of this sheet is enclosed.</p> <p>NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.</p> <table style="width: 100%;"> <tr> <td style="width: 60%;"> SEND ALL CORRESPONDENCE TO: Dr. Jan P. Wilbert Riegerweg 7 82024 Taufkirchen Germany </td> <td style="width: 40%; vertical-align: bottom;"> <div style="text-align: right;">  SIGNATURE Dr. Jan Paul Wilbert NAME REGISTRATION NUMBER </div> </td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total claims	- 20 =		X \$18.00	\$	Independent claims	- 3 =		X \$78.00	\$	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$	TOTAL OF ABOVE CALCULATIONS =				\$	Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$	SUBTOTAL =				\$	Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	TOTAL NATIONAL FEE =				\$	Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$	TOTAL FEES ENCLOSED =				\$ 840					Amount to be refunded: \$					charged: \$	SEND ALL CORRESPONDENCE TO: Dr. Jan P. Wilbert Riegerweg 7 82024 Taufkirchen Germany	<div style="text-align: right;">  SIGNATURE Dr. Jan Paul Wilbert NAME REGISTRATION NUMBER </div>
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE																																																																
Total claims	- 20 =		X \$18.00	\$																																																															
Independent claims	- 3 =		X \$78.00	\$																																																															
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$																																																															
TOTAL OF ABOVE CALCULATIONS =				\$																																																															
Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28).				\$																																																															
SUBTOTAL =				\$																																																															
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$																																																															
TOTAL NATIONAL FEE =				\$																																																															
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				\$																																																															
TOTAL FEES ENCLOSED =				\$ 840																																																															
				Amount to be refunded: \$																																																															
				charged: \$																																																															
SEND ALL CORRESPONDENCE TO: Dr. Jan P. Wilbert Riegerweg 7 82024 Taufkirchen Germany	<div style="text-align: right;">  SIGNATURE Dr. Jan Paul Wilbert NAME REGISTRATION NUMBER </div>																																																																		

ART 34 AMDT

G/PRT

09/601013

1/5

534 Rec'd PCT/PTC 26 JUL2000

Device for testing the electromagnetic compatibility of systems having large dimensions

Especially in the military field it is **known** that EMC-susceptibility tests are based on a pulse-shaped short stimulation. With these test by far stronger inhomogeneous fields come to application. Through the usual shape of the wave guides from the source to the termination of the impulse, no optimal testing field for civil requirements can be produced. Bends in the wave guide, geometrical changes of the wave guide from the source to the termination relative to its return conductor, a mismatched adaptation between the measurement of the equipment under test and the testing volume, the arrangement of the loading device in the testing volume and the testing volume loss originating by this, rail shaped and other sparking gaps between impulse source and field-generating wave guide arranged in an angle to the wave guide which differ largely in the geometry from the wave guide, lead to reflections which influence the extension of the pulse negatively and, by this, lead to a deterioration of the produced electromagnetic field in the testing volume. Furthermore, too long wave guides lead to an obliteration of the pulse, respectively a radiation of energy, as usual in many installations, and, with that, restrict its frequency spectra. With sine shaped fed wave guides or strip lines dimension-conditioned frequency range restrictions occur. Also with other similar testing methods, as the use of antennas with a determined directive diagram in an appropriate dimensioned unachocic chamber as usual in the automobile technique, no economical justifiable testing against electromagnetic radiated fields is possible for larger systems. In particular, no special susceptibility test for a whole train is existing at present.

Burst generators, which produce nano second impulses (5/50 ns) in fast succession and over controllable spark gaps with variable amplitudes, belong also to the state of art in the technique (DE 43 40 514 C2). However, conditioned by construction, these burst generators cannot replace a testing device described in the above mentioned patent claim for systems having large dimensions but serve rather the conductor led component test.

The advantages obtained by the invention consist in particular of the enormous time saving in testing time, the obtained field quality and the applicability for any long equipment under test with simultaneous minimal length of a single pulse conducting wave guide achieved through the modular structure. The test of a whole train in the far field, without a movement of the radiation

09/601013-072600

The invention mentioned in the patent claim underlies the **problem**, to create generally for a complete system having large dimensions, a homogeneous testing field accepted by rules of the civil EMC-susceptibility-technique (ENV 50140).

The **advantages** obtained by the invention consist especially in, instead of the piecewise EMC-susceptibility-test of systems with large dimensions leading to wrong results, a complete illumination of the equipment under test can be made (all) at once in nano seconds or in a few seconds while running repeatedly. Through keeping the characteristic impedance, a testing field with extraordinary quality will be produced.

The **testing chamber** with large dimensions results from the parallel mounting of the module shown in figure 1 with further modules equal in construction. A change of the field polarization can be reached by turning the arrangement around the length axle of equipment under test.

ART 34 AMDT

4/5

the in fig. 5 illustrated variation between point 14 as reference point and respectively all other measuring points (6 to 12 possible points exceed the 6-dB-criterion).

00561012.072600

Patent claims

1. Device for testing the electromagnetic compatibility and (EMC)-susceptibility, especially for systems having comparatively large dimensions as wagons and/or trains, with impulse generating wave guides (IGW) which are arranged parallel and show electrical conducting single rods (2) switched together over an head electrode (5), which are connectable over a rail-shaped spark gap (4) in direct line with impulse-conducting wave guides (ICW), which, in return, are connected preferable right angled with an terminating characteristic impedance (6) in order to build up a testing chamber for the system to be tested, which, preferably right-angled attached, with one or several return conductors is switched together, at which the magnitude of the terminating characteristic impedance (6) with, at the most a few ohm difference, correspond to the impulse generating wave guide (IGW).
2. Device after claim 1, is characterized that the terminating characteristic impedance (6) which is developed planar or is consisting of several single characteristic impedance's.
3. Device after claim 1 or 2, is characterized that several of the devices are switched together as modules in order to lengthen the testing chamber.
4. Device after claims 1 – 3, is characterized that the rail-shaped spark gap (4) is assigned for a tube with variable pressure.
5. Device after claims 1-4, is characterized that testing of the systems is practicable repeatedly in the range of nano seconds to seconds.
6. Device after claim 1, is characterized that the impulse generating wave guide (IGW) is arranged parallel to the return conductors with essentially the same characteristic wave impedance as the ICW.

Summary**EMV-testing device for systems having large dimensions**

According to the law for electromagnetic compatibility of 1 January 1995 all electrical apparatus must have a certain resistance to interference by electromagnetic fields. Especially in the case of systems having large dimensions, such as trains, it is at present not possible to carry out such a test economically using conventional methods. The invention relates to a test device, which makes such a testing possible and beneficial. According to the invention, a test device consists of a novel arrangement of an impulse-generating wave guide (IGW), which consists of parallel, electrically conductive individual rods, which are connected over by a head electrode and, via a rail-like spark gap which is in a straight line with an impulse--conducting wave-guide (ICW) which is identical in structure but longer, is closed at right angles with a terminating resistor. A return line is connected to said terminating resistor. Several of these IGW, ICW, return lines and termination resistors arranged as described above can be connected in parallel in a modular manner via a shared release mechanism and therefore create a testing space suitable for a large system.

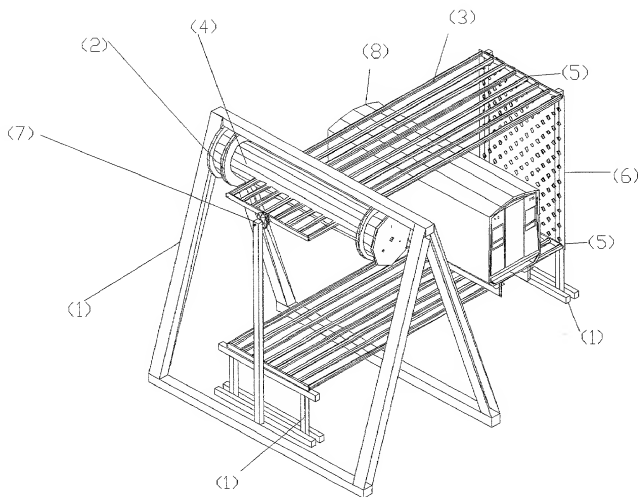


Fig. 1 A performance example of a module with a carrying rack, a high voltage connection and an equipment under test section in vertical polarization

- (1) Rack out of electrical, non-conducting material
- (2) IGW
- (3) ICW
- (4) Pressure tube and rail-shaped spark gap
- (5) Bus bar
- (6) Terminating impedance
- (7) Triggered first spark gap and high voltage source connection

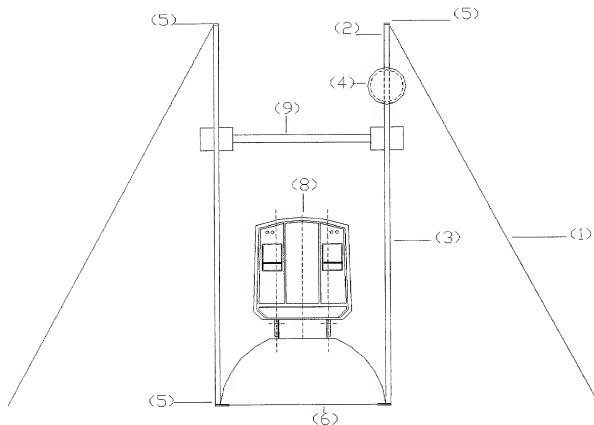


Fig. 2 A performance example of the horizontal polarization

- (1) Wooden rack
- (2) IGW
- (3) ICW
- (4) Pressure tube and rail-shaped spark gap
- (5) Bus bar
- (6) Terminating characteristic impedance
- (7) Triggered first spark gap and high voltage source connection
- (8) Train section in the testing chamber
- (9) Synthetic column



0000000000

- 0000000000**

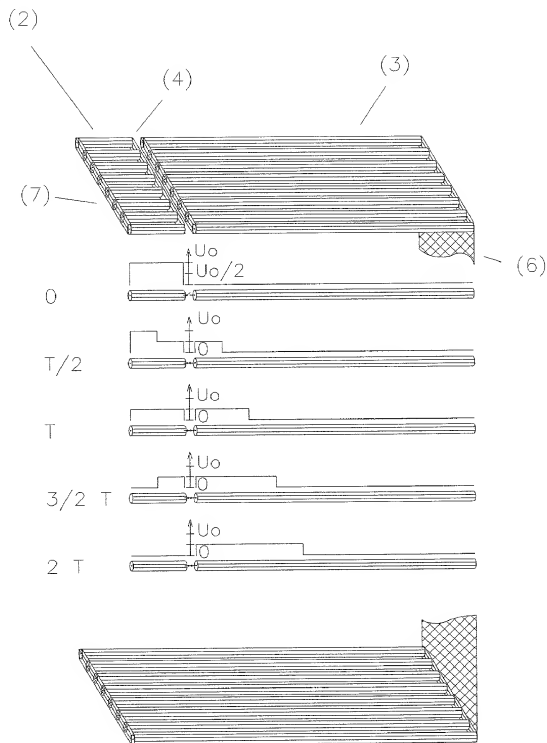


Fig. 4 Function

- (1) IGW
- (2) ICW
- (3) Rail-shaped spark gap
- (4) Terminating impedance

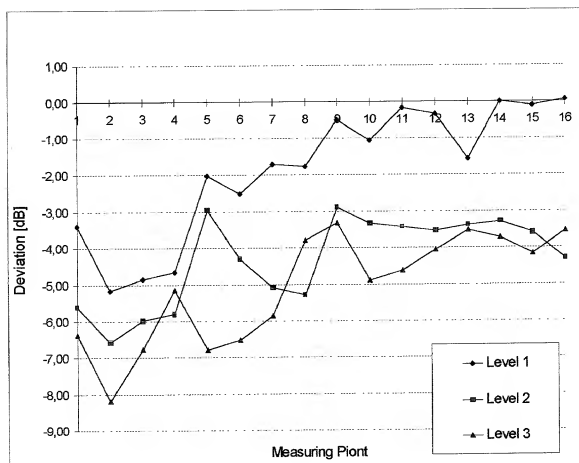


Fig. 5 6-dB-criteria of all measuring points in the testing chamber

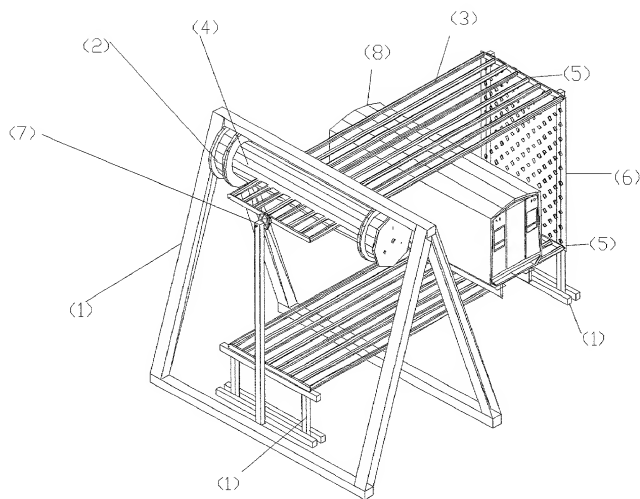


Fig. 1 A performance example of a module with a carrying rack, a high voltage connection and an equipment under test section in vertical polarization

- (1) Rack out of electrical, non-conducting material
- (2) IGW
- (3) ICW
- (4) Pressure tube and rail-shaped spark gap
- (5) Bus bar
- (6) Terminating impedance
- (7) Triggered first spark gap and high voltage source connection

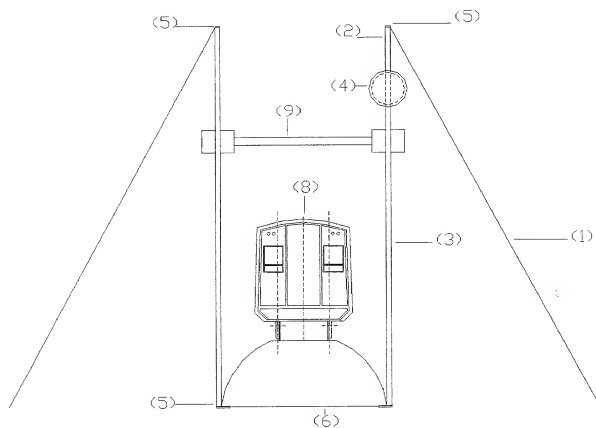


Fig. 2 A performance example of the horizontal polarization

- (1) Wooden rack
- (2) IGW
- (3) ICW
- (4) Pressure tube and rail-shaped spark gap
- (5) Bus bar
- (6) Terminating characteristic impedance
- (7) Triggered first spark gap and high voltage source connection
- (8) Train section in the testing chamber
- (9) Synthetic column

3/6

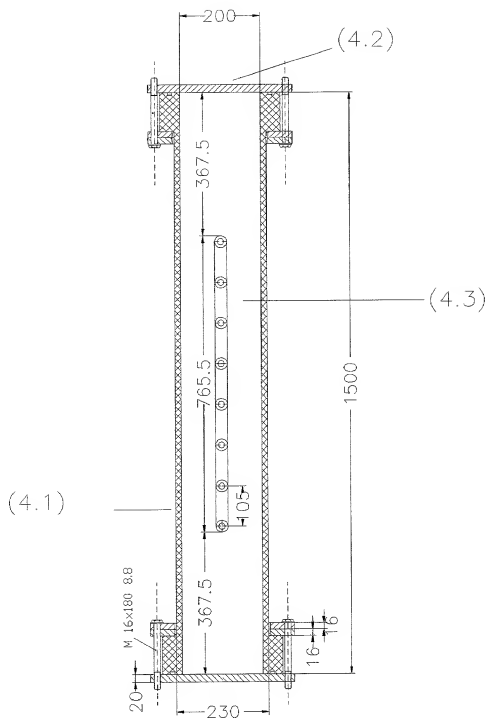


Fig. 3 A performance example of the pressure tube with electrode as detail of figure 1 and figure 2

(4.1) GFK-tube

(4.2) Lit

(4.3) Rail-shaped electrode, serves as connection for the single wave guides at the same time

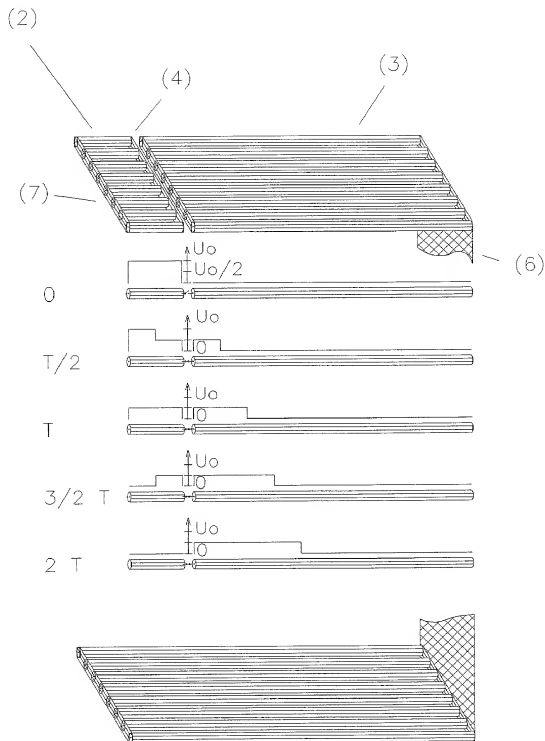


Fig. 4 Function

(2) IGW

(3) ICW

(4) Rail-shaped spark gap

(6) Terminating impedance

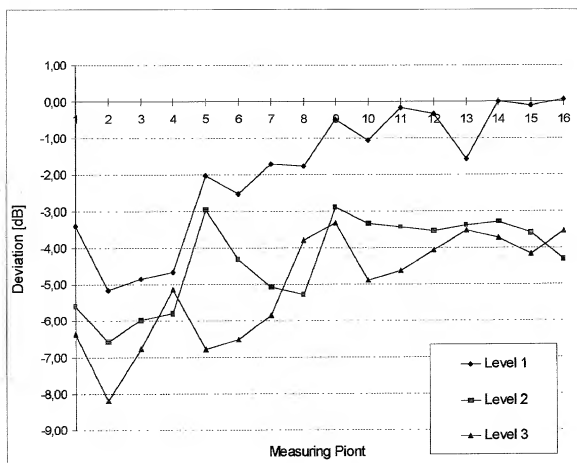


Fig. 5 6-dB-criteria of all measuring points in the testing chamber

Please type a plus sign (+) inside this box →

PTO/SB/02A (3-97)
Approved for use through 9/30/98. OMB 0651-0032

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

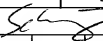
DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet

Page of

Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor									
Given Name (first and middle (if any))					Family Name or Surname				
Inventor's Signature					Date				
Residence: City		State		Country			Citizenship		
Post Office Address									
Post Office Address									
City		State		ZIP			Country		

Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor									
Given Name (first and middle (if any))					Family Name or Surname				
Inventor's Signature					Date				
Residence: City		State		Country			Citizenship		
Post Office Address									
Post Office Address									
City		State		ZIP			Country		

Name of Additional Joint Inventor, if any: <input type="checkbox"/> A petition has been filed for this unsigned inventor									
Given Name (first and middle (if any))					Family Name or Surname				
Harald					Schwarz, Dr.				
Inventor's Signature					Date		12.01		
Residence: City		Cottbus	State		Country		Germany	Citizenship	
Post Office Address									
Am Feldrain 29									
Post Office Address									
DCK									
City		State		ZIP		03054	Country		

Burden Hour Statement: This form is estimated to take 0.4 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS SEND TO Assistant Commissioner for Patents, Washington, DC 20231.

09/6010131

Please type a plus sign (+) inside this box ☐

PTO/SB/01 (12-97)
Approved for use through 9/30/00 OMB 0651-0032
Patent and Trademark Office, U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 35(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
PCT/DE 99/00369	17/01/99	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

<input type="checkbox"/> Customer Number		<input type="checkbox"/> Registered practitioner(s) name/registration number listed below	
Name	Registration Number	Name	Registration Number

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

Direct all correspondence to: ☐ Customer Number or Bar Code Label ☐ OR ☐ Correspondence address below

Name	Dr. Jan P. Wilbert		
Address	Riegerweg 7		
Address	DEX		
City	LAUFKIRCHEN	State	
Country	Germany	Telephone	+49 89 612 038 65
		ZIP	82024
		Fax	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
2 JO Jan Paul		Wilbert, Dr.	
Inventor's Signature	Dr. J. Paul	Date	12.01
Residence: City	LAUFKIRCHEN	State	
		Country	Germany
Post Office Address	Riegerweg 7		DEX
Post Office Address			
City		State	
		ZIP	82024
		Country	

☐ Additional inventors are being named on the supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.